

CaseMaster[®]

multipurpose Sealed Quench chamber furnaces

Technological applications

- Gas carburizing
- Austenitic carbonitriding
- Bright hardening
- Annealing in protective atmospheres
- Carbon recovery

Typical load types

- Aircraft industry:
aircraft engine components (oil pumps, clutches, manometer pistons, pinions, yokes, pins, etc) and aircraft undercarriages
- Automotive industry:
gearbox components and drive axles (shafts, gears, etc)
- Machine building industry:
drive axles, gear wheels, toothed rings, hydraulic and pneumatic elements, bolts, etc
- Bearing industry:
bearing rings



Main technical data for standard sizes* of CaseMaster® furnaces

AFS/ AFC		2	5	10	17
Useful dimensions					
height	mm	500	610	760	910
width		400	610	760	910
length		650	910	1220	1220
Load weight (gross)	kg	180	400	1000	1360
Atmosphere demand	Nm ³ /h	5,6	10	16	21
Engines power					
atmosphere mixer	kW	1,1	4	4	5,5
vestibule mixer		3	2x2,2	2x2,2	2x2,2
loading drive		0,55	2,2	4	5
unloading drive		0,55	2,2	4	5
Maximum heating power					
electrical	kW	59	72	140	180
gas		88	120	220	260
Quenching system productivity					
atmosphere mixer	m ³ /h	1880	5000	7800	11700
cooling circuit pumps		~15	~50	~60	~75
quenching oil tank capacity	m ³	2	4,5	8	14
Quenching system productivity	mm	1105	1105	1200	1200

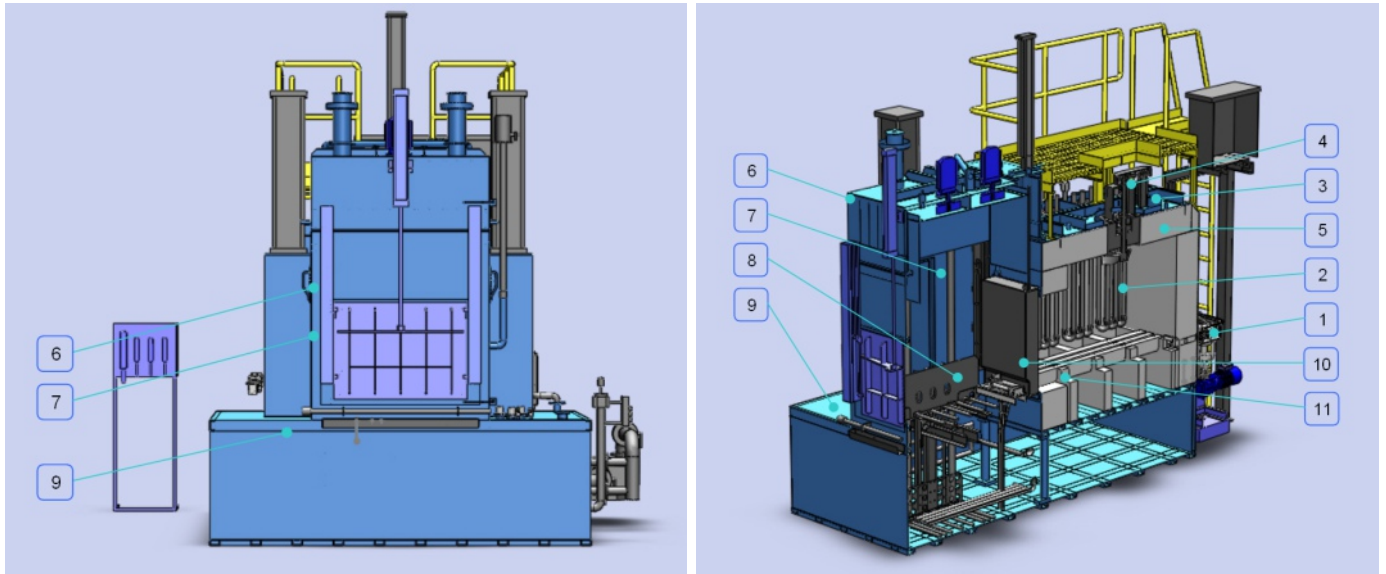
The following brochure data are for information only. The offered equipment particulars should be confirmed by and determined with the right SECO/WARWICK employees. Some data might be round.

* Customised versions can be produced to the furnace chamber dimensions requested by customers.

Key construction features of CaseMaster® furnaces

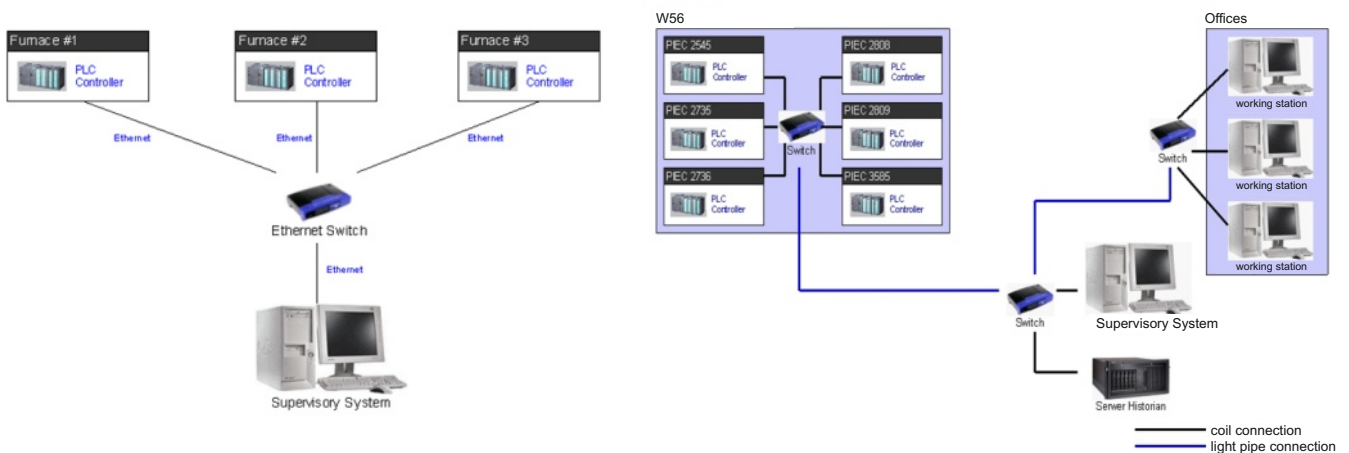
- Nominal temperature: up to 1000°C
- Very good temperature uniformity of $\pm 5^\circ\text{C}$ in the furnace's heating chamber
- Very good output of oil circulation system

The CaseMaster® chamber furnaces work with controlled atmospheres and have integral quench tanks. They are equipped with the following main systems and subassemblies:



1. Load-Unload mechanism in the "cold chain" system
2. Auto-recuperative gas burners (also available as an option with radiant tubes made of SiC)
3. Carbon potential control system on the base of the oxygen probe (or gas analysers)
4. Highly efficient atmosphere mixer with a compact design
5. Light construction ceiling made using fibrous insulation materials
6. Oil-cooled vestibule walls, which eliminate the risk of water vapour condensation
7. Slow cooling chamber in the protective atmosphere
8. Automatic fast internal transportation system
9. Oil quench tank with a system for heating and cooling the oil, equipped with a pump-collector system which enables the modeling of direction and flow frequency of the quench oil
10. Very tight internal door
11. Perforated bottom plate made of SiC

Control System

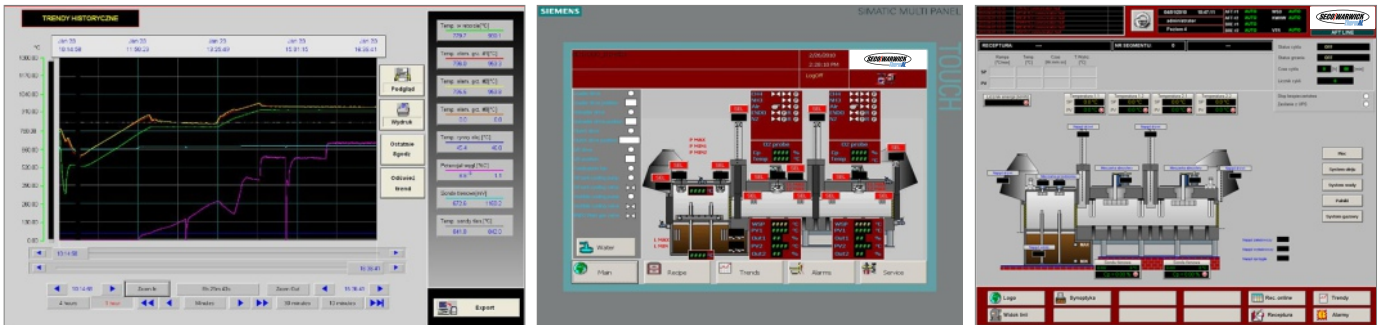


Automatic control of CaseMaster® furnace operation

The control system of the furnace covers all the functions connected with every mechanism and the power supply of particular energy receivers installed in the furnace. Set point process parameter values can be introduced, indicating the temperature and carbon potential course over a specified time. The control system provides full visualisation of the furnace operation, and signals failure conditions. As a standard, CaseMaster® Sealed Quench furnaces have temperature and carbon potential control systems operating on the base of the oxygen probe, as well as a programmer for temperature and carbon potential. Key functions of the system include: programming, control, archiving, and heat treatment process reporting. Other equipment can be incorporated into and controlled by the computer system. The main software module includes databases of materials, heat treatment processes, etc.

CarboSystem enables the following functions to be performed:

- calculation of the carbon diffusion profile during carburizing in the "on line" mode
- calculation of the furnace atmosphere composition based on mathematical modeling
- graphic presentation of calculated carbon profile, predicted hardness profile, current process status on Fe-C diagram and iron oxidation diagram
- scheduling of service inspections



Auxiliary equipment for use with CaseMaster® Sealed Quench chamber furnaces



High tempering chamber furnace BREW type



Low tempering chamber furnace BREN type



Chamber washer WSD type

CaseMaster® furnaces can be equipped with the following auxiliary equipment:

- TASKMASTER® mobile loading and/or unloading
- Endothermic atmosphere generators
- Loading tables
- Special instrumentation

Complete technological lines incorporating CaseMaster® Sealed Quench furnaces

The configuration of technological lines incorporating CaseMaster® chamber furnaces with integral quench tanks is created depending on the individual requirements of each customer and the specifics of the relevant technological process.



Main advantages of Sealed Quench chamber furnaces CaseMaster® type

- High quality parts following heat treatment
- Very good processes repeatability
- Minimisation of quench distortions
- No load decarburization and oxidation
- High reliability
- Low consumption of technological mediums
- The ability to configure a complete and automatically controlled heat treatment centre
- Full automation of the process
- Minimisation of negative environmental effects
- Furnace is delivered to the customer as a “turnkey” installation, after completion of various tests prior to shipment to guarantee high manufacturing quality
- Conformity with AMS 2750D





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